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SUPPLY CHAIN DESIGN FOR NEW PRODUCT LAUNCH PROCESS

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Abstract

The increased competition, the shift to a customer-driven market, and product variations have increased pressure on today's companies to develop new products with shorter cycle times. However, there is much uncertainty in the product launch process. Companies have invested significant resources to make the product launch successful and mitigate any negative effects. Launching a new product into the competitive market requires company managers to develop an optimal supply chain system that aligned with the company's overall strategy. An effective supply chain is needed to respond to the fast changes in demand or other unexpected disruptions in the new product launch process.

In order to identify the opportunities and challenges in the new product launch process, this thesis will explore the supply chain design based on the SCOR model and study the integration of supply chain management into the new product launch process. This research is relevant to executive level managers since it provides companies with guidelines to make critical supply management decisions for the new product launch process. This initial research is tailored for the consumer goods manufacturing industries, but can be adapted to other product and services industries.

Keywords: New products, Supply chain management

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Introduction

Currently, the success of many businesses depends on new products since a large portion of the sales come from them. As the market has become highly competitive, consumers are more demanding than ever; consequently, they are looking for products that can better improve their life quality. According to the survey conducted by *The Journal of Business Forecasting (JBF)* in 2009, 20 percent of a company's sales come from new products. Therefore, companies today must invest significant resources in innovation and introduce more new products to the market in shorter time periods. Regardless of this point, introducing a new product to the market is often very challenging to companies, from different perspectives of the supply chain network. For example, when a new product is approved, the company needs a demand forecast to determine the right quantity to produce, plans materials accordingly, and foresees the possible supply chain disruptions and risks. As there is no history to refer to for the new product and there is uncertainty in the process, a new product launch event is not only an exciting event, but also a challenge to companies.

A new product may be defined as a product, service, or an idea not currently made or marketed by a company. There are different definitions for “new” (Gilliland and Guseman) (Figure 2):

- (1) New to the world (entirely new categories of products introduced to the market)
- (2) New to the company (company enters the existing market)
- (3) Product improvement, or line extension (such as “new and improved” versions)

A company's new product launch process is decided by the type of the industry in which it operates. According to a survey conducted by JBF in 2006, there are much

higher percentages of new product launch events in apparel & footwear (51%), computer & technology (38%), and retail (33%) (Jain, 2006). As it is said by the senior vice president of strategic planning of Samsung Electronics, Dr. Young Cho Chi, in his interview with ABC News, “[Companies] have to be very speedy. Speedy, not only in the term of making decisions to enter today’s area, but also, speedy, in terms of making decision all along the value chain...” A responsive and efficient supply chain is the core component in the success of the whole value chain. Companies such as Wal-Mart and Procter & Gamble have identified supply chain management as their core competency and have organized their corporations around supply chain proficiency.

This study will provide a comparative analysis of new product launch processes of several leading companies in different consumer goods manufacturing industries. This analysis is based on the Supply-Chain Operations Reference-model (SCOR), which is a process model that includes planning, sourcing, making, delivering and returning, spanning from upstream suppliers to downstream consumers (Supply Chain Council). Four of the five management processes are going to be covered in the study: planning, sourcing, making, and delivering (Figure 1). Planning refers to aggregating demand forecast and orchestrating sourcing, production, and delivery activities for the new product launch process. Sourcing refers to the process that procures goods and services to meet planned demand. The making process transforms raw materials to finished products and the delivering process moves finished product to customers. Numerous real-world business cases will be discussed as examples to demonstrate the common business practices of the new product launch process. This thesis will specifically address the following topics:

- Demand forecasting for new products that incorporates qualitative information into quantitative forecast numbers
- Strategic sourcing for new products to follow production plan
- Manufacturing new products to meet estimated demand
- Delivery of new products to satisfy customers' needs

Supply Chain Plan

The planning process for a new product launch forms the first step in the SCOR model. Planning involves a course of actions to estimate the demand and meet sourcing, production, and delivery requirements for the new product launch process. Since all parties in the supply chain interact and all business processes are integrated, planning activities are required in all phases in the new product launch process. Therefore, this section is going to focus on demand forecasting for new products. Sourcing planning, manufacturing planning, and delivery planning are going to be discussed further in the respective sections of different processes in this paper.

New Product Forecast

Developing a forecast for a new product has been called, “one of the most difficult and critical management tasks” (Assmus, 1984). At the very beginning of the supply chain, forecasting has been identified as a very critical step in the new product launch process. Compared with existing products, new products have no historical data about sales volume, trade agreements with retailers, and competitors’ reactions. In some cases, the error in new product forecasting can be as much as twice the error of an established product (Gilliland and Guseman).

There are a number of models used for new product forecasting, including the Delphi method, the Analog method, etc. The *Delphi Method* is a structured process to survey forecasting participants and anonymously share results. Participants then can make adjustments to their own forecasts. According to *JBF*, the model used most for new product forecasting in business is the Analog method in one form or another (Gilliland and Guseman). The Analog method is based on the assumption that the demand for a new

product will be similar to the demand of a like, established product. The forecast of the new item is based on the sales history of the similar item. In order to make the forecast for new products as objective as possible, there are also various software packages created based on these methodologies. Software can collect organizational data, incorporate statistical analysis, process heavy computational work, and provide logical guidance to forecasters.

In today's business world, companies always utilize all of these techniques mentioned above. Since all of these methods have to partially depend on the judgment of the forecasters, it is of great importance to assess the reasonability of forecasts. This assessment should be based on all available information within or outside of the organization. No matter which method a company uses, there are some common practices that various industries incorporate into the new product launch process.

The Initial Marketing Forecast

Sales forecasting is one of the most common activities that marketing managers have to work on. According to Kennametal's stage gate process, marketing practitioners step in the new product development process at the very beginning. Along with engineers, marketers identify customer needs and incorporate them into new product ideas. They analyze industry trends and work closely with customer contacts. Marketing managers can forecast the size of a market or product category. All the information that marketers hold can result in an initial demand forecast for the new product. Marketing provides initial insights to forecasters. According to a recent benchmarking conference conducted by Kimberly-Clark, many firms' forecasters receive insights on product cannibalization and product category assumptions from marketers. But Company X also notes the bias in

marketing forecast from its previous new product launches. Since marketers' forecast is always an important factor in the product approval stage to decide if a new product launch is a viable option for the firm, the forecasting number from marketers is often higher—"at least high enough to meet any hurdles for getting the new product approved for development!" (Gilliland and Guseman) However, it is understandable that since marketers' forecast always comes out at the very beginning of the new product launch stage, there is less information available to the marketers. Therefore, it is very important for forecasters to understand the bias of marketers' forecasts when they combine various forecasts of the new product.

Forecasts Based on "Like" Item's Sales History—Part of Analog Method

As mentioned above, the Analog approach is a very common forecasting method in various industries. Forecasters always identify one or multiple "like items" and analyze the historical sales data of the like item to decide the initial forecast number. Forecasters always pick the "like item(s)" from the same product category, season of introduction, and target market demographic. The forecasters' judgment is always a big part of new products' forecasting process. However, it is crucial for forecasters to avoid creating overly optimistic forecasts for the new product because of "a natural tendency of forecast high" (Gilliland and Guseman). The Analog approach requires the historical sales data of the "like item". In addition, it is critical for forecasters to keep in mind the differences between current products and the new product, as well as the differences in economic environment. It is necessary for forecasters to make adjustments to the forecasts when they take these factors into consideration.

Sales Force's Involvement in the Forecasting Process

How can forecasting be a part of salesperson's job? According to a recent survey of forecasting practices by sales people, almost 82 percent participate in forecasting. Most manufacturing companies today establish sales teams for their top customers. Since sales teams work so closely with the customers, they have more knowledge of customers' future purchasing plans. Company Y is a paper-based consumer product company who recently launched a new line of feminine care products. Since this new product launch has been one of the biggest launches for the company in recent years, Company Y worked in depth with its top customers' sales teams to incorporate their customers' demands into the new product production plan. Forecasters collected information on the number of stores taking the new SKUs, product display plans, the new product's promotional events, order quantity estimates, and new product launch dates. The details of retailers' purchasing and marketing information that Company Y collected was fascinating.

Unfortunately, most sales teams work on commission. Therefore, when it comes to forecasting the demand for the new product, they may intentionally forecast high to ensure enough inventory of the new product, or low to make their sales shares easy (Gilliland and Guseman). On the other hand, since there is only a very small percent of salespeople trained in forecasting, the quality of the salesperson's forecast is not as accurate as could be expected (Mentzer and Moon). Some companies, like Company Y, have noticed an area of improvement for salespeople's forecast quality. Company Y has put forecasting in the performance evaluation process for its sales force. However, it should also be noted that forecasting is very time consuming for the salespeople; consequently, it

may negatively affect the sales force's relationship with customers. This is an organizational decision that companies' executives have to evaluate based on trade-offs.

In general, forecasting for new products requires collaborative efforts from different departments in a company. Combining forecasts always increases the accuracy since most of the forecasting methods rely on forecasters' judgment (Moutinho and Southern). Forecasters utilize information systems to analyze the data of the "like" item and integrate the inputs from customers' marketing plans. As there is always uncertainty in the new product launch process and demand forecasting is the start of the supply chain, the whole organization should support the forecast; moreover, be prepared to resolve forecast errors.

Strategic Sourcing

Kimberly-Clark and other manufacturing companies, such as Procter & Gamble and Kraft, have paid greater attention to their sourcing function in the past years. The supplier selection problem always involves two major questions: (1) which supplier(s) should be selected and (2) how much order quantity should be assigned to each supplier selected (Weber and Current).

Supplier Evaluation

Cost, quality, delivery and flexibility are the four primary aspects of making sourcing decisions (Liao and Rittscher). Sourcing managers should consider the total cost, the quality rejection rate, the late delivery rate, and the flexibility rate of their sourcing partners. In April 2010, Boeing delayed production of the 787 airplane for the entire month of May because their suppliers struggled with part shortages (Mecham, 2010). Therefore, manufacturers should always have a clear idea whether their suppliers have the capacity to keep up with demand changes.

With respect to new products, flexibility and delivery can be the two most critical evaluation criteria. Because of the uncertainty in demand quantity and manufacturing schedule, the importance of supplier flexibility should be extended. One solution to improve the flexibility of sourcing process is cross-sourcing. There are many advantages and disadvantages regarding single or multiple suppliers. Cross-sourcing is a “hybrid” approach that “expands the supplier base without increasing the actual number of suppliers.” For example, Supply A and B can both supply Company Z with parts 1, 2 and 3. Company Z can procure parts 1 and 2 from supplier A and procure part 3 from supplier

B. In this case, if supplier A cannot follow the delivery schedule, supplier B can pick up the orders as it has the capability to produce part 1 and 2 as well (Craighead, 2010).

If the current supplier is not able to accommodate extra demand for the materials needed for the new product, or the new product requires a new kind of material into the manufacturing process, manufacturers have to establish a new partnership with suppliers who were not part of the current supply chain (Awasthi, Chauhan, Goyal, and Proth). A manufacturer has to first identify what the critical or unique materials that the new product needs and what the capacity requirements are for the materials. The manufacturer then needs to select a pool of suppliers who are capable of providing the materials and meeting the manufacturing capacity. Then they should assess the suppliers' financial health and expertise, which includes product quality, production capability, etc. The suppliers' operational performance is another important evaluation criterion. Manufacturers should look at the potential supplier's on-time delivery rate, lead time, and inventory management and control (Craighead, 2010).

Global sourcing is another strategic solution in the procurement process. Global sourcing comes with the same costs found in domestic sourcing, as well as some additional costs, such as duty charges and customs fees. One of the most attractive benefits of global sourcing is the low direct labor and materials costs. But when a company sources for a new product, sourcing managers have to see the potential risks involved since global sourcing is much more complex than domestic sourcing. First, a company may have to increase their quality control process, which consumes more financial resources. Manufacturers also need to prepare for possible pipeline delays and disruptions in the supply chain. The distance between firms can be significant in terms of

time zones and physical location (Craighead, 2010). Because the new product launch can be the most important event for a company in recent years and there is great uncertainty through the process, organizations have to decide if the cost difference between global sourcing and domestic sourcing is worth the risks. For a new product launch, cost should not be the only factor in making a sourcing decision. A responsive supplier can help a manufacturer achieve advantages over competitors in the long term. Many domestic suppliers may not be able to offer a competitive price, but there may be opportunities to start a truly supportive relationship with the supplier. They can work with manufacturers on price and arrange other incentives a foreign supplier cannot match.

Sourcing is very critical in the SCOR model also because it can result in severe supply chain disruptions if managed poorly. Especially for a new product, using specialized or unique subassembly components that may be impossible to procure from secondary suppliers can create a supply chain risk. For example, Boeing's 787 Dreamliner airplanes experienced several delivery delays since Boeing had a shortage of nuts and bolts used to assemble the Dreamliner. Those parts are highly-specialized parts produced by a few of Boeing's suppliers. Those suppliers cut their production capacity when the economy was bad. Therefore, when Boeing intended to speed up its production, those suppliers could not catch up with Boeing's orders. The suppliers' delivery failure of these two critical parts led to loss of millions of dollars for Boeing (Gonzalez, 2009). In order to mitigate the risks associated with critical/unique parts of a new product, manufacturers should keep a "just-in-case" inventory of those key parts. In addition, as it was mentioned before, cross sourcing for unique parts can be a strategic solution to mitigate the negative effect caused by disruptions in the sourcing process.

Supplier Integration into New Product Development

In the past, selecting appropriate suppliers for the raw materials of the new product was primarily the job of engineers, who determined the final design for the new product. But recently, many companies have started to involve suppliers in the new product design process early. The Global Procurement and Supply Chain Benchmarking Initiative at Michigan State University conducted a study recently on companies who incorporate suppliers in the design process. This study has developed a planning process to help firms decide “what level of supplier expertise is appropriate” in the new product development (Simchi-Levi, Kaminsky and Simchi-Levi):

- Determine the company’s internal core competencies
- Determine current new product developments
- Identify external development and manufacturing needs

If the new product requires expertise that the firm does not currently possess and the firm has no plan to develop that expertise, the manufacturing company should collaborate with the supplier to establish joint developments. The benefit of supplier integration into the new product development is to create a “synchronized” supply chain. By being involved in the development process, suppliers will be able to know exactly when and what is needed. On the other hand, the manufacturer will be able to produce more innovative products. BMW’s 7 Series is an example of the benefits of this methodology. This new model optimized the suppliers’ effort in the design process as BMW’s suppliers worked closely with BMW to minimize the product cost and ensure the product quality (Cottrill, 2006).

Make

Manufacturing Capacity Planning

Inventory is a significant portion of costs for most companies. Supply chain managers often try to maintain enough inventories to buffer against manufacturing lead time. Responsiveness is one matrix used to review the inventories and lead time associated with each step in the manufacturing process. Responsiveness of a supply chain is a very critical factor in the success of a new product launch process. Manufacturers have to make sure that necessary resources, such as equipment and raw materials, meet the production objectives in a timely manner. Especially for new product's production, plant managers need to maintain a balance between the required capacity and the available capacity (Business Basics). Once the company decides on a forecasted volume, supply chain managers have to make sure that the company can handle the estimated production volumes. The resulting actions can be expanding a firm's own operations by building new facilities, hiring additional workers, or reallocating current workload in existing facilities. As a result of these considerations, companies always prefer new products that utilize existing production facilities or parts. This strategy can take some pressure off of the existing supply chain. However, if supply chain managers are not able to successfully assess the current manufacturing capacity, new product launch execution can be easily disrupted. The snack producer, Nabisco has learned its lesson when it first introduced the SnackWell's Devil's Food Cookie Cakes in 1993. This new product of Nabisco was said to be "the hardest [cookie]" Nabisco had ever made, according to Brian Beglin, senior director of operations services for Nabisco. The production of this cookie required custom-made machinery, which was only available in one bakery, owned by

Interbake Foods Inc. The entire process of making the Devil's Food Cookie Cakes took four hours, compared to 30 minutes for Chips Ahoy. The manufacturing capacity of the new product was unable to meet consumer demand. As a result, it was only being sold in northeastern states and lost sales in the national market (Deveny, 1993).

For a complex, new product, key manufacturing processes may not be mature at the start of production. There is always a learning curve for the workforce to become familiar with the production processes of a new product. In order to mitigate the risk of production failure and bring manufacturing process under control, companies may plan for "production ramp-up" (Figure 3), which means that "the firm starts commercial production at a relatively low level of volume; as the organization develops confidence in its (and its suppliers) abilities to execute production consistently and marketing's abilities to sell the product, the volume increases" (Wheelwright and Clark). Once the quality targets are met, workforces are fully trained, and production lines are stable, companies will ramp up the production for full rate production. As the quality and availability of finished products are directly tied to the manufacturing capability, manufacturers should monitor initial production and adjust production process and materials to make the operation smooth (Yamada, 1989).

As technologies, such as internet communications and RFID tags, become more advanced, companies are able to run operations globally. Therefore, the supply chain network has become more complex than ever. The global flow of goods enables companies to recover from a production breakdown in one factory in one country, by quickly replacing shipments from manufacturing plants elsewhere. However, globalization also makes the supply chain more vulnerable, as a supply chain disruption

in one country/region can be globalized now. The Japanese earthquake and tsunami that happened in March, 2011 was a “severe test” for companies operating in Japan (Lohr, 2011). As it was reported in *Bloomberg BusinessWeek’s* March issue, some U.S.-owned manufacturing plants in Japan were hit severely by the disaster. For example, the silicon wafer plant of Texas Instruments in Miho, Japan, which produced 10% of company revenue, “had sustained ‘substantial’ damage” (Black, 2011).

Make or Buy Decision: Contract Manufacturing

Availability of production capacity and cost control are two important factors in the production process. For many new products, being late to the market can decide whether the product launch is a success or a failure. In order to meet the new product’s demand, firms have different options to manage its manufacturing function. Rather than manufacturing a product in-house, a company can purchase it from an external supplier. This “make-or-buy” decision compares the costs and benefits of manufacturing a product or a product component against purchasing it from outside of the company (Barron’s Marketing Dictionary). A company may decide to buy a part, rather than produce it internally if it lacks the in-house expertise, or would like to test the new product in small volumes. However, if the company wants to utilize its existing production capacity and have more control over the new product’s quality, it will make the new product in-house (Investopedia Financial Dictionary). Once a company decides to buy from outside of the company, it may choose to utilize contract manufacturing practice to meet the unpredictable customer demand of a new product. In a contract manufacturing model, the brand company hires a contract manufacturer to produce and ship on behalf of the brand company. Since many of the contract manufacturers are specialized in their industries and have advanced

production equipment, the learning curve for new product manufacturing can be minimized, especially for some complex products. This phenomenon is especially noticeable in the electronics industry. Foxconn is the world's largest maker of electronic components. This company makes consumer electronics for a number of famous-name companies, including Apple, Cisco, Hewlett-Packard, and Dell. Today, very few electronics manufacturing companies do in-house product assembly. Contract manufacturers, such as Foxconn, offer flexibility and ease electronics companies' pressure of investing large amount of money in equipment and human resources. Therefore, electronics companies can respond to a sudden change in customer demand more quickly and efficiently. But there are also lots of risks associated with contract manufacturing. For example, Foxconn has been revealed multiple times in the news for requiring long working hours and for other kinds of employee mistreatment. When the contract manufacturer is being criticized, its customer, which in this case is Apple, also comes under public scrutiny (Balfour and Culpan).

Deliver

Distribution Network Design

When new products come out, companies have to incorporate them into the existing distribution network. A company can utilize either direct or in-direct distribution approach. Logistics personnel have to consider the cost of distribution, the degree of control needed for a company's sales strategy and its consumers' buying behavior to decide whether the company can by-pass third-party distributors, and sell directly to its market. A distributor's expertise is built upon its strong relationships with their local customer base so that they are able to manage a large portfolio of different companies' products. However, a distributor may not have the time, technical skills, and resources to support all the introductions of new products. If a manufacturing company's operational strategy is to focus on the products and seeks to distribute to the mass market, third-party distributors will be a vital option. Wholesalers, such as the drug wholesale company, AmerisourceBergen Corporation, have been indispensable partners for many consumer goods manufacturing companies. However, most companies sell products through a variety of locations from mass merchandise to the internet. They work closely with individual retailers such as Wal-Mart and Target, through the new product launch process. Manufacturing companies have many decisions that they need to make, such as where to store their inventories and how much inventories they need to hold or put into the pipeline. For example, Company Y would like to expand on its old feminine hygiene brand by adding a new line of products under the same brand name. Many retailers were very confident in the new line of products and wanted to be the first to carry it in their stores. However, because of production capacity constraints, Sales teams, the Planning

team, and the Distribution team had to work together with customers to negotiate the reasonable orders for the first few weeks after launch.

Vendor Management Inventory

Companies always need to reserve some inventories for the new product, for which demand is still unknown. In order to minimize the inventory cost, companies prefer to keep the inventory at the optimal level, which can fulfill customers' orders and spend less on the carrying cost. Vendor Management Inventory (VMI) is a methodology that many companies are utilizing today to ease the process of inventory management. Information technology plays an important role in the roll-out of VMI. Companies have to develop a robust and user-friendly tool for both internal employees and retailer's buyers. The VMI model helps manufacturing companies strengthen their partnership with customers and increase visibility of their customers' forecasts. They are able to minimize orders for specific products with production constraints and control over ship dates during peak volumes. On the other hand, customers can manage daily inventory review, reduce the possibility of stock-outs, and have fewer emergency orders (Franke, 2010).

This method has especially been effective for the new product launch process. Since most companies limit VMI offerings to strategic partners, customers, and sizeable supply-chain impact regional players, manufacturing companies can better monitor large retailers' existing products' inventories and help buyers make ordering decisions to smooth the flow of new products. Company Y has 30 customers on the VMI initiative, which includes 200 distribution center and 500 stores. VMI customers represent 30% of Company Y's North American consumer sales. Orders can be created 7 days a week for customers with high volume and Company Y offers reduced lead times for customers

with consistent shipment volume. For Company Y's new line of feminine hygiene products, since the DC level inventory was known, supply chain managers were able to generate a reasonable guess on the replenishment volumes. VMI provided a more accurate forecast for the new product launch.

Transportation Mode Selection

Transportation modes are the means by which companies move raw materials and finished goods from point A to point B. Road transportation is the most popular option for many firms as trucks can serve most inland areas. Therefore, it is the best means to move light-industry products that require "rapid movements of freight in small batches". In contrast, rail transportation is more usual to be used in heavy industries because rail can offer a very high capacity in land. Maritime transportation is "the most effective to move large quantities of cargo over long distances." However, because of geographical limitations, shipping products by sea can only serve the coastal areas and inland areas with waterway systems. Air transportation is the fastest method of delivering goods and the most expensive. Therefore, air cargo services are always used when time is the most important factor in delivering goods for companies. Pipelines are the least commonly used method of transportation as they are primarily designed to move gas and oil, instead of consumer goods industries (Slack, Rodrigue, and Comtois). When a company chooses the transportation mode for a new product, it has to balance the transportation cost and the delivery time it requires to move the products. As it was mentioned, each mode has its physical constraints. In order to improve the flexibility of a certain transportation mode, most companies today utilize a combination of modes of transportation. For global consumer goods companies, they usually ship containers from their oversea plants to a

port in North America. Then products are picked up at the port and delivered the products, just like a normal truckload. In order to save labor cost, intermodal shipping requires specialized containers and other tools that allow goods to be transferred from one mode to another without having to be repacked. The advantages of intermodal transportation are remarkable. Company Y made use of intermodal (truck and rail) in 2009 and reduced diesel usage by 8 million gallons. It was able to reduce carbon dioxide emissions by 150 million pounds and achieve over \$30 million in savings compared to over the road.

Packaging Design

Most commercial packaging serves two basic functions: enclosing and protecting products from damages, and enticing customers. From a supply chain standpoint, the package is not only an attribute to attract the attention of consumers, it can also contribute to production and transportation cost savings. Oddly shaped or fragile products can drive up transportation costs significantly because of the additional costs of material handling tools and labor. Products that can be shipped in standardized packages and containers can take advantage of lower transportation rates and lower costs of distribution. Companies have to decide how much they are willing to spend on product packaging and transport to protect the products. In order to decrease the portion of goods that can be damaged during storage, transportation, and distribution, companies have to ensure the new product possess a robust packaging design for various shipping methods that may be used to transport the finished goods. For example, Company Z plans to ship a new mode of computers from the contract manufacturing site in Taiwan to a US port on the west coast by ocean. Then products will be transported to the distribution centers in various cities in North America. The package of the new product not only needs to be able to withstand

the pressure of several other boxes stored on top of it in the truck, it also needs to be able to resist moisture, adapt to temperature changes, and withstand rough handling on the ocean and at the port. Companies have to recognize various levels of packaging requirements for different transportation methods (Chelko, 2011).

The “green supply chain” has become a hot topic in the supply chain management field. Many companies today have integrated the concept of sustainable development into product packages. Procter & Gamble had introduced seven new products during 2009 that either use less energy or have enhanced packaging that generates less waste and uses less fuel for transport. These products include the famous detergent brand Ariel, whose packaging was redesigned to optimize shipping and reduce fuel usage. Ariel granule detergent used to be packed in eight bags into one corrugated box (Figure 4). The P&G Turkey team designed a new kind of packaging bags, which required 80% less packaging material than it used to need (PG.com). Another example of companies embracing sustainability strategy is Unilever. Unilever removed unnecessary layers of packaging such as outer cartons and shrink-wrap film (Figure 5). For Unilever’s Wish-Bone Salad dressing, Unilever’s shipper redesigned the package from box to tray and reduced almost 5000 truckloads yearly (Garcia, 2009). If a company would like to launch a new product, it has to consider the “green” factor in product packaging designs in addition to cutting cost since consumers today are more environmental consciousness than before.

Conclusion:

The focus on supply chain efficiency in the past has left many corporations with a vulnerable supply chain. New products' supply chain disruptions can have a massive impact on companies if they are not managed properly. It can hurt the relationship with retailers if poor order fulfillment occurs; consequently, launch projects will fail because companies cannot manufacture adequate quantities of the new product and make them available to prospective consumers. Supply chain managers have to prepare for any supply chain disruptions and develop strategic solutions to mitigate negative effects (Bender, 2007). No matter what product is to be introduced to the market, the characteristics of the new product have to be analyzed first, since different industries have their own "rule of thumb" in demand forecasting, sourcing, manufacturing, and the delivering process. In addition, companies need to assess the new product to the existing market position. New products can be a features-added version of an existing product. By comparing with a similar product that a company has already carried in store, valuable product launching experience can be generated. Globalization has made supply chains more complicated throughout the past decade. In addition to increasing their market share in the global market, many firms have suppliers and manufacturing sites around the world that they have to manage. When a company considers outsourcing the production of a new product to another country, it has to bear in mind the risks associated with the new product's unpredictable demand, the long delivery lead time, and the maturity of the new product production process. This is a decision that has to be made between the upper management team and the different organizations who are involved, to ensure that the company's strategy aligns with the actual execution.

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Appendices

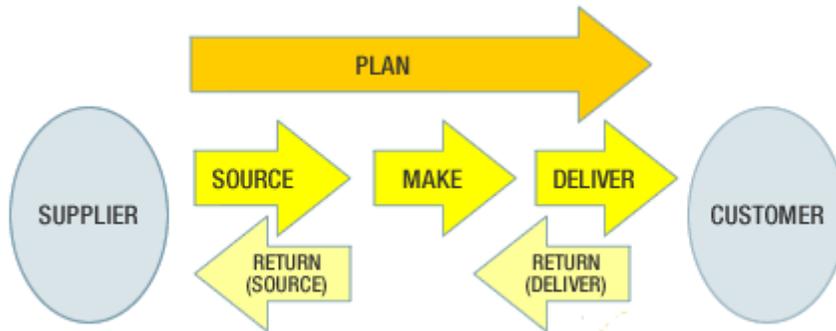


Figure 1. Supply-Chain Operations Reference-model (SCOR)

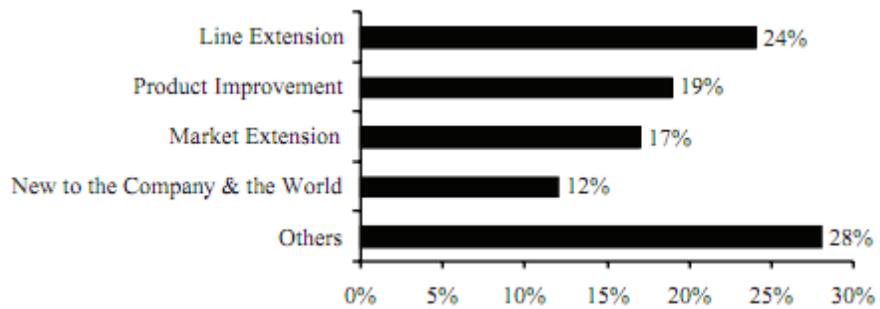


Figure 2. New product sales as a percentage of total by type of new product (2006; all industries combined)

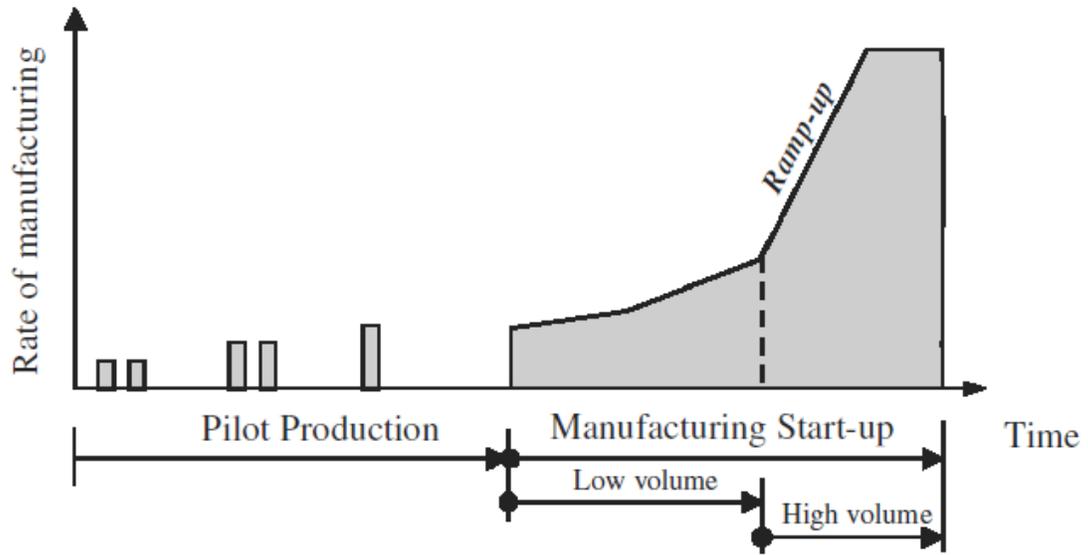


Figure 3. The distinction between pilot production, low-volume and high-volume production



Figure 4. P&G’s Ariel brand switched from cardboard shipping boxes (left) to seal-tight plastic bags (right) to save 20% space

Packaging Reduction

- Wish-Bone Salad dressing
Shipper redesign to Tray/Shrink
2,100 tons fewer corrugated
11,000 fewer pallets
almost 500 fewer truck loads
- Knorr Recipe Mix
Replace pouch/carton with pouch
50% reduction!

Material reduction in metric tons

Figure 5. Unilever’s Sustainable Packaging Strategy

Guan Li

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EDUCATION

The Pennsylvania State University

The Smeal College of Business; the Schreyer Honors College

Bachelor Science Supply Chain and Information Systems

Minor: Information System Management

Dean's List (Fall 2007-Fall 2010)

University Park

Class of 2011

RELEVANT EXPERIENCE

ExxonMobil Information Technology

Global Change Initiatives—Portfolio Analyst Intern

Fairfax, VA

5/10-8/10

- Led the Lotus Notes Application Migration Study for downstream business lines
- Researched on Microsoft SharePoint and other platforms to recommend application migration strategy for each business lines
- Completed the migration strategy analysis for 70% of total Downstream Lotus Notes custom applications

Kimberly Clark Corporation

Sales Planning—Logistics Co-op

Neenah, WI

1/10-5/10

- Investigated the best practice process for selecting customers to forecast individually and made a recommendation to the Sales Planning Organization
- Led benchmarking efforts with various consumer product companies on new product launch support
- Investigated WTI weather forecast service and its application for Huggies Little Swimmers business

ExxonMobil Information Technology

Remedy Application Support Team—Analyst Intern

Houston, TX

5/09-8/09

- Led the Server Synchronization project which synchronized two different databases and made critical changes to reinstate the original process document to improve procedures
- Analyzed Oracle 10g Online Database Reorganization technology and implemented into Acceptance environment, which showed a potential of saving \$100,000 and 1000 work hours per year for ExxonMobil

The Pennsylvania State University Smeal College of Business

Office of Career and Corporate Services—Office Assistant

University Park, PA

9/07-Present

- Provided information and guidance to students seeking program information
 - Interacted with corporate recruiters to assist with the coordination of on-site visits and interview schedules
 - Supported staff by creating presentations, reports, and spreadsheets to manage student records
 - Managed the course management system and Facebook group for Smeal Career and Corporate Services for advertising the office and services to students
-

ACTIVITIES

Asian American Student in Action

Mentor

8/10-Present

- Provided guidance and developed meaningful mentoring relationship to other Asian and Pacific Islander American students who are new to University Park with their adjustment
- Empowered mentees to get involved in the university life through program events and weekly contact with mentees

Chinese Undergraduate Student Association (CUSA)

Secretary

9/08-12/09

- Took minutes and attendance for officer meetings, maintained email list of the club and sent weekly-update emails to more than 100 members
- Collaborated with CUSA officers and other student organizations to develop club events, including an award-winning event, Chinese Karaoke Contest, and Chinese New Year Celebration which drew almost 300 students and created awareness of cultural diversity on campus

Schreyer Honors College THON: Largest student-run philanthropy in the world

Finance Co-chair and THON 09 Dancer

9/08-12/09

SKILLS AND INTERESTS

- Fluent in English and Mandarin
- Proficient in Microsoft Office Suite and adequately proficient on IBM Lotus Notes and MS SharePoint